

West Nile Virus Surveillance Summary

2004

Surveillance conducted by the
Wisconsin Department of Natural Resources on Non-corvid Species
Report compiled by: Tricia L. Fry and Julie Langenberg

West Nile Virus (WNV) is an arbovirus transmitted by mosquitoes. Native to Africa, this disease was first identified in the United States in the fall of 1999. West Nile Virus expanded its distribution across North America, and as of the end of 2004 was identified in each of the 48 contiguous states. Since 2001, the Wisconsin Department of Natural Resources has worked with other agencies and organizations to more fully understand the distribution and movement of West Nile Virus in Wisconsin and nationwide. With the help of the Wisconsin Department of Public Health, the Wisconsin State Laboratory of Hygiene, the Wisconsin Veterinary Diagnostic Lab, USDA- Wildlife Services-APHIS, and Marshfield Clinical Research Foundation, nearly 2,000 birds and non-human mammals have been tested for the evidence of WNV since 2001.

In previous years West Nile Surveillance included the sampling of Corvids, but in 2002 the WDNR began testing selected non-corvid birds and some mammals for the presence of WNV due to concerns over the spread and ecological importance of WNV infections in a variety of animal species (Wisconsin corvids continued to be sampled through cooperative organizations). WNV surveillance across the state was achieved with the help of biologists, wardens, and the public. This resulted in the sampling of 107 bald eagles, 77 other raptors, 158 perching birds, 184 waterbirds, 62 upland game birds, and 79 mammals that were tested for WNV from 2002 through 2003. Evidence of WNV in non-corvid species from this time period was found in 17 bird species: Sandhill crane, white-throated sparrow, grackles, eastern blue bird, American robin, mourning dove, Downy woodpecker, cedar waxwing, black-capped chickadee, hairy woodpecker, northern cardinal, tundra swan, merlin, sharp-shinned hawk, red-tailed hawk, bald eagle, and northern goshawk; and three mammal species: gray wolf, big brown bat, and gray squirrels.

2004 Surveillance Agenda

In 2004, the Wisconsin Department of Natural Resource's surveillance plan focused on studying the prevalence of WNV in non-corvid bird species and mammals, while partner organizations including USDA-APHIS and Department of Public Health continued surveillance on corvids. During 2004, we continued to collect information that would aid in understanding our long-term objectives related to West Nile Virus. These objectives are to:

- Determine how WNV impacts wildlife populations, specifically the difference in WNV prevalence and its affects on more abundant species versus less abundant, more specialized species
- Attain information that would assist in understanding the trends and distribution of WNV nationwide
- Assess the possible risks of WNV to humans, including hunters and bird enthusiasts.

Species and groups of species targeted for 2004 surveillance included:

1. Any animals showing neurological signs
2. Any bird species involved in significant mortality events (die-offs)
3. Gray wolf necropsies
4. Small mammals, including gray squirrels, chipmunks, and bats
5. Song birds
6. Raptors, including bald eagles collected for necropsy at NWHC
7. Waterbirds including shore birds, cormorants, herons, and gulls
8. Game birds

Additional species that we agreed to test opportunistically were:

1. Elk
2. White tailed deer
3. Species involved in ongoing research including canids, American pine martens, sandhill cranes, peregrine falcon and osprey chicks, and other nestlings

Species where further testing was unnecessary were:

1. Corvids
2. Waterfowl, including common loons and common terns
3. Bald eagles
4. Game farm pheasants
5. Grackles
6. Cottontail rabbits

Results of 2004 West Nile Virus Surveillance

Results available at this time confirm that during 2004, 7 animals showed evidence of exposure to West Nile Virus. The results of an additional 36 passerines are still pending. These 7 positives were the result of testing 242 individuals comprising 55 different species. The total number of species and groups of animals we tested is presented in Table 1. Table 2 shows the number of individuals tested and those with positive results by species. These samples were collected from 56 counties. The majority of WNV screening used tissue samples, these samples were analyzed using a plaque assay (PA). Live animals were tested using the serum dilution neutralization test (SDNT).

The positive sharp-shinned hawks were collected in Adams and Clark counties. The positive bald eagle was from Lincoln county, and the red-tailed hawks were from Milwaukee and Rock counties. The elk was from Ashland County, and had a positive WNV titer.

Table 1. Summary of Species/Groups Targeted for West Nile Surveillance.

	Species	Individuals	Positives
Raptors	13	75	4
Bald Eagles	1	19	1
Wolves	1	19	0
Water Birds	5	8	0
Song Birds	20	43	0
Game birds	2	21	0
Elk	1	2	0
Small Mammals	11	59	2
Other Birds	2	4	0
Totals	55	242	7

Table 2. 2004 West Nile Virus Surveillance by Species .

Species	# Positive	Total Tested	Species	# Positive	Total Tested
Elk*	1	2	American Robin	0	3
Big Brown Bat	1	29	Cedar Waxwing	0	5
Chipmunk	0	1	Common Flicker	0	3
Northern long-eared Bat	0	1	Common Nighthawk	0	1
Fox Squirrel	0	2	Downy Woodpecker	0	1
Gray Fox	0	3	Goldfinch	0	2
Gray Squirrel	0	8	Gray Catbird	0	5
Ground Squirrel	0	1	House Finch	0	3
Little Brown Bat	0	12	House Wren	0	1
Red Fox	0	1	Northern Cardinal	0	3
Red Squirrel	0	1	Northern Oriole	0	2
Bald Eagle**	1	19	Ovenbird	0	1
Barred Owl	0	1	Purple Finch	0	1
Broad-winged Hawk	0	1	Purple Martin	0	1
Cooper's Hawk	0	5	Rose-breasted Grosbeak	0	1
Great Horned Owl	0	6	Ruby-throated Hummingbird	0	2
Long-eared Owl	0	1	Savannah Sparrow	0	1
Merlin	0	1	Tree Swallow	0	4
Osprey*	0	13	Yellow-bellied Sapsucker	0	2
Peregrine Falcon*	0	10	Yellow-billed Cuckoo	0	1
Red-shouldered Hawk	0	0	Gray Wolf	0	11
Red-tailed Hawk	2	9	Double-crested Cormorant	0	1
Screech Owl	0	1	Great Blue Heron	0	4
Sharp-shinned Hawk	2	7	Great Crested Flycatcher	0	1
Kestrel	0	1	Loon	0	1
Mourning Dove	0	17	White Pelican	0	1
Wild Turkey	0	4	American Crow	0	3
Sandhill Crane	0	1			

* All individuals were tested using SDNT

** 3 of 19 Bald Eagles were tested with SDNT, the remaining 16 individuals with tissue samples (PA)